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DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF, CHEMICAL CORPS
Chemical Corps Technical Committee
Army Chemical Center, Maryland
GROUP 4

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TSE/5190/blac
30 Sept 1949

CMLWH

SUBJECT: Classification of GA as a Limited Standard Type.

TO: Chairman, Chemical Corps Technical Committee

CCTC
ITEM 2034

1. References:

- a. CWTC Item 1573, 16 Jan 1946
- b. CCTC Item 1890, 25 May 1948
- c. Monthly and Quarterly Progress Reports, 1946, Medical Div, A Cml C, Md.
- d. TDMR's 1138 and 1176, Technical Command, A Cml C, Md.
- e. Porton Technical Papers Nos. 25 and 35.
- f. TCIR 382, Technical Command, A Cml C, Md.
- g. D/F (S), CMLWD-S, S&P Div, OCCmlC, 7 Feb 1949, "Disposition of GA-Filled Munitions", to R&E Div, OCCmlC, w/2 Incls and Comment 2, CMLWR-R-2, 25 March 1949, to C, S&P Div.
- h. Ltr (S), CMLWE, OCCmlC, 13 May 1949, "Munitions and Agents of German Origin", to Pres., Cml C Bd, w/2 Incls and 3rd Ind, CMLWK, Cml C Bd, 8 June 1949, to C, Cml C, w/4 Incls.
- i. Memorandum (S), CMLWR-D R&E Div, OCCmlC, 1 June 1949, "Detailed Examination for Standardization of Agents of the G-Series".

2. Discussion:

a. Toward the end of the war intelligence reports indicated that the Germans had developed a new group of quick-acting organo-phosphorus CW agents now known collectively as the G-series. Reference a. indicates Technical Committee action which identified 5 members of the group and approved symbols therefor, namely: GA, GB, GD, GE, and GF. The second member of the series has already been adopted as a substitute standard type by the action of reference b. This paper is concerned with appropriate classification action for the first member of the series, GA, which is known chemically as cyanodimethylaminoethoxyphosphine oxide, is called Tabun by the Germans, and identified as MCE in some reports.

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2. Discussion continued:

b. The action which standardized GB (ref. b.) indicated in detail the characteristics of both GA and GB with reference to original reports and memoranda. For the purposes of this paper essential data pertaining to GA may be summarized as follows:

(1) Physical Characteristics (GB is listed for comparison).

Agent	GA	GB
Formula weight	162.3	140.1
Freezing point °C.	-50	-58
Boiling point °C.	246	147
Volatility mg/l at 30°C.	0.86	23
Hydrolysis rate: Half life, hours	6	36
Odor	Faintly Fruity	None when pure but slightly irritant..
Detectable conc. mg/m3	2.2	9.0
Toxicity to Man, LCt50 mg/min/m3 (Estimated)	(b)(2) HIGH	

b(2) high

(2) Medical Aspects

Like all members of the G-series, GA is much more toxic than standard CW agents either by inhalation of the vapors or application to the skin and causes serious physiological effects within a short time of exposure. This results in depletion of the protein enzyme cholinesterase with subsequent respiratory and vasomotor failure producing quick death if the dosage has been of lethal proportions. Treatment for exposure to G-agents must be almost immediate to be effective. To date atropine administered intramuscularly provides the most effective therapeutic agent. The psychological value of these agents is clearly indicated in early German reports which pointed out the damage to the central nervous system caused by GA and that resulting effects could easily cause panic among untrained or unprotected troops subjected to such attack..

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2.b. Discussion continued:

(3) Protection, Detection and Decontamination

(b)(2) HIGH

b(2) high

(4) Production and Storage

(b)(2) HIGH

b(2) high

Small quantities of GA for test purposes only have been produced at A. Cml. G, ME. in view of the emphasis and concentration on the GB problem discussed in reference b. In order to assure stocks of GA for large scale tests, quantities of captured German materiel were shipped to the U.S. after VE-Day. Total stocks of agents currently on hand amount to approximately 530 tons stored principally in bombs and shells. Surveillance has indicated that the GA is in Class A condition with the munitions considered suitable only as storage containers due to extensive rehabilitation required for adaptation to American use.

(5) Utilization

(b)(2) HIGH

b(2) high

g. The ultimate disposition action for GA-filled munitions now on hand in Chemical Corps installations was raised by reference g., and

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2.c. Discussion continued:

related correspondence. In this connection Comment No. 2 of this reference indicated that all GA should be retained for possible use either as a persistent or nonpersistent agent depending upon the means of dispersion employed. Likewise, reference h. directed that the Chemical Corps Board consider the problem which was followed by further study by R&E Div, and S&P Div, OCCmLC. As the result of all review of the problem, the special Chemical Corps Board meeting held 6 June 1949 recommended that all stocks of GA be retained in storage at present locations and that action be taken to declare it limited standard. This action was in conformance with that noted in reference i. which indicates results of the detailed examination of the G-series agents conducted in connection with the Tripartite Standardization Program. In connection with GA, reference i. pointed out that GA was inferior to GB, that no more should be manufactured, but that existing stocks would be useful in an emergency. These recommendations, therefore, recognize the value of existing quantities of GA for War Reserve purposes with appropriate classification to preclude further procurement assuring, however, incorporation of stock now on hand into the supply system for use as may be required.

d. Pursuant to SR 705-5-1, 17 March 1949, the following information is tabulated in connection with the proposed action:

- (1) GA is an expendable item.
- (2) Estimated cost in quantity production: \$1.00 per lb.
- (3) Stock status:
 - (a) On Hand: Approximately 530 tons, stored in German 250 Kg. bombs and other munitions.
 - (b) On Contract: None.
- (4) No future procurement of GA is contemplated in view of the existence of a more satisfactory G-series agent (GB). Consequently, there are no existing facilities for production of this agent. On the other hand no critical or strategic material would be required for GA manufacture.
- (5) No specialist training is required by this action. Extra care and precaution, however, must be observed when handling GA.
- (6) Training literature is available:
 - (a) D/A Cir 74, Chemical Agents of the G-Series, 19 March 1948.
 - (b) TB CW 34, Treatment of Poisoning Caused by Chemical Agents of the G-Series, 19 March 1948.
- (7) Security classification: The chemical name or formula is Secret when used conjunctively with the symbol or other means of identification. The agent itself is con-

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2.d.(7) Discussion continued:

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sidered Restricted. All other phases of security are in accordance with the provisions of CCS 883/10, 21 Aug 1946, "Policy on Security Classification and Dissemination of Information Concerning German War Gases".

(8) Stock Number: 354315.

e. The foregoing paragraphs summarize the current status of GA and identify it as the first member of the G-series quick-acting agents of which considerable stock is now on hand as captured enemy materiel originally made available for large-scale experimental purposes. Since the testing program indicates that present stocks of GA will be available for indefinite storage and that the quantity involved would be a desirable asset for War Reserve purposes, classification as limited standard is considered both a logical and timely proposal. By such action the subject agent may be incorporated into the supply system for further testing or use in appropriate munitions as may be required. Although the physical characteristics of GA place it in the category of persistent agents contemplated dissemination methods would result in nonpersistence as is the case with GB, consequently, GA should be recorded to meet the requirement for a quick-acting nonpersistent. Appropriate recommendations to accomplish the action outlined herein are noted below.

3. Recommendations:

It is recommended that:

- a. Quick-Acting, Nonpersistent Agent, GA, as identified in paragraph 2.a. above, be classified as a Limited Standard type.
- b. GA be further classified as a Class V, authorized, essential item of current supply.
- c. The Chemical Corps be charged with all responsibilities for the subject agent.
- d. Authorization for the use of GA as a munition filling be withheld pending completion of developments now in progress.
- e. Stocks of GA now on hand be retained in storage as assets to meet requirements for quick-acting, nonpersistent agents.
- f. GA be classified for security purposes as indicated in paragraph 2.d. (7) above.
- g. Stock records and other publications affected by this action be revised accordingly.

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Concurrence Signatures

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for E. P. Mechling, Col, USAF
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/s/ Samuel H. Fisher, Col, GSC
for O. S. Rolfe, Col, GSC
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/s/ Jack F. Lane, Maj, Cml C
for H. W. Rowan, Col, Cml C
Chemical Corps Board

/s/ Walter A. Guild, Col, Cml C
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/s/ C.H.M. Roberts, Col, Ord
Ordnance Department

/s/ C. F. Filter
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Quartermaster Corps

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Transportation Corps

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ACCEPTED BY THE CHEMICAL
CORPS TECHNICAL COMMITTEE:

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CHEMICAL CORPS:

APPROVED BY ORDER OF THE
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